

Aeronautics

Aviation
Careers in Aviation
Principles of Aeronautical Science
Introduction to Space Flight
Private Pilot Operations

Architecture

CAD (Drafting)
3D CAD
Architectural CAD

Automotive

Small Engines/Power
Advanced Small Engine Performance
Automotive Service & Diagnostics
Car Care Essentials

Engineering

Engineering and Invention 1
3D CAD
Engineering and Invention 2

Furniture Making

Introduction to Furniture Making
Furniture & Cabinet Making I & II

General Electives

Technology Concepts
Home Maintenance and Repair
Industrial & Related Occupations I & II
Career Internship

TCD Connections

Pre-Architectural/Pre-Engineering
Landscape & Design
Construction Trades
Auto Body Repair & Refinishing
Automotive Technology

Applied Technology

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Applied Arts Division Philosophy

The Applied Arts Division mission is to develop students that are life-long learners through their engagement in the integration and application of multiple curricular areas. The Division offers diverse learning opportunities for all students and prepares students through its 3 departments to make life decisions in education, career, family, leisure, and life skills.

Applied Technology Department Philosophy

The Applied Technology Department empowers the student to understand, utilize, and apply comprehensive technology skills that exist in higher education and the workplace. The department assists the student in the development of teamwork, analytical, and problem solving skills. The development of leadership abilities is present throughout the curriculum. The department fosters creativity, independence, self-reliance, and self-sufficiency through comprehensive, progressive programming.

Programs	South Campus	North Campus
Communications	Technology Concepts CAD (Drafting) Architectural CAD	CAD (Drafting) 3D CAD Architectural CAD
Construction	Introduction to Furniture Making Furniture & Cabinet Making I, II	Home Maintenance & Repair Introduction to Furniture Making Furniture & Cabinet Making I, II
Manufacturing	CAD (Drafting) Engineering & Invention 1	CAD (Drafting) Engineering & Invention 1, 2 3D CAD
Transportation	Aviation Careers in Aviation Small Engines/Power Advanced Small Engine Performance Principles of Aeronautical Science	Car Care Essentials Automotive Service & Diagnostics Automotive Service & Diagnostics Introduction to Space Flight Principles of Aero Science Private Pilot Operations
Career Development	Industrial & Related Occupations I, II	

Suggested Course Sequencing (Please read descriptions for content and prerequisites)

Aeronautics	Aviation - Careers In Aviation - Principles of Aeronautical Science - Introduction to Space Flight Private Pilot Operations
Architecture	CAD (Drafting) - 3D CAD - Architectural CAD
Automotive	Small Engines/Power - Advanced Small Engine Performance - Car Care Essentials - Automotive Service & Diagnostics
Engineering	Engineering and Invention 1 - 3D CAD - Engineering and Invention 2
Furniture Making	Introduction to Furniture Making - Furniture & Cabinet Making I & II
General Electives	Technology Concepts - Home Maintenance and Repair - Industrial & Related Occupations I & II
TCD Connections	Pre-Architectural/Pre-Engineering - Landscape & Design - Construction Trades Auto Body Repair & Refinishing - Automotive Technology

Applied Technology Department Standards

The Applied Technology Department has established standards based on resources gathered from national and state professional organizations in the fields of technology, technology education, engineering, science and math, and career development. There are nine general standards as indicated below. Each general standard is supported by specific student learning standards that are available upon request. Specific course standards have been developed to support the general standards and these are distributed to students at the beginning of each semester, or annual course.

Students within Applied Technology will be able to....

1. select/use appropriate technological instruments/tools and formulas to solve problems, interpret results, and communicate findings.
2. accept opportunities to develop expertise, experience, and emotional intelligence for transferable employability skills in relation to individual, career, and community roles and responsibilities.
3. develop skills, strategies, expertise, experience, and emotional intelligence for career exploration and transferability skills in relation to the career clusters of technology, transportation, communication, and manufacturing.
4. analyze the internal and external factors that influence individual, work teams, and commercial enterprises.
5. develop and apply strategies to manage conflict and stress in individual and team situations.
6. recognize and be able to demonstrate effective verbal and non-verbal communication skills.
7. evaluate decisions in relation to available resources and options.
8. demonstrate leadership skills and abilities reflecting democratic ideals at school, in the workplace, and in the community.
9. promote optimal growth, development, and learning of self, family, community, and others as a life-long activity.

- All courses listed under Applied Technology apply toward the Practical Arts graduation requirement.
- **Independent Study** Under specific conditions as outlined on p. 25 of the **Guide**, students may make application for Independent Study. In all cases, students must secure parent, teacher, counselor, divisional, and building administration approval. Independent Study may not be taken as an 8th semester/annual course.

AERONAUTICS

Aviation

Credit: 1/2 (cr/nc)	Level: IV
Grade Offered: 9, 10	Fall AT5156
Prerequisite: None	

Aviation is a survey course. Modes of aerodynamic travel are studied in this course. This course discusses advanced aircraft and the technology around them. Aerodynamic forces are explored through hands on projects. Subjects include aircraft history, categories, as well as developments in aviation.

Principles of Aeronautical Science

ERAU AS120 (3cr)

Credit: 1/2	Level: IV		
Grade Offered: 10		Fall	AT5216
		Spring	AT5217
11, 12		Fall	AT5211
		Spring	AT5212
Prerequisite: None			

Principles of Aeronautical Science is a survey course. Modes of aerodynamic travel are studied in this course. This course discusses advanced aircraft and the technology around them. Aerodynamic forces are explored through hands-on projects. Subjects include aircraft history, categories, as well as developments in aviation. **Transcripted college credit with Embry-Riddle Aeronautical University.**

Careers In Aviation

Credit: 1/2	Level: III
Grade Offered: 9, 10	Spring AT3127
Prerequisite: None	

The careers in aviation course will explore the people behind the machines in an in-depth analysis of the requirements educationally for those careers. Responsibilities of the career options will be studied. This course will define choices for the student enabling him to make better decisions about future career paths. Subjects include historical developments in the airline industry, aircraft systems, meteorology, and air traffic principles.

Introduction to Space Flight

Credit: 1/2	Level: IV
Grade Offered: 11, 12	Fall AT3221
	Spring AT3222
Prerequisite: None	

This course is a survey of space flight. Exploration will take place in the classroom in the form of simulation and research. Topics covered include the history of space flight, space shuttle operations, and present and future commercial, industrial and military applications in space. Hands on projects will be an integral part of this course.

Private Pilot Operations ERAU AS121 (5cr)

Credit: 1 (dc)	Level: V
Grade Offered: 11, 12	Annual AT3361 AT3362
Prerequisite: Principles of Aeronautical Science or Division Chair approval	

This course develops aeronautical knowledge required for certification as a Private Pilot with an Airplane Single Engine Land rating. Topics include regulations, safety, pre-solo operations, cross-country planning, airspace, chart use, communications, weather, performance, weight and balance, aerodynamics, and decision-making. The student will utilize simulation in class so that they can apply knowledge of the subject to the aircraft. **Transcripted college credit with Embry-Riddle Aeronautical University.**

ARCHITECTURE

CAD (Drafting)

Credit: 1/2 (cr/nc)	Level: III or IV
Grade Offered: 9, 10	Fall AT5536
	Spring AT5537
11, 12	Fall AT5531
	Spring AT5532
Prerequisite: None	

Drafting is a valuable part of our global society. It sometimes referred to as the “universal language.” This course is an excellent choice for those students wishing to explore the field of drafting, planning a career in engineering, architecture, construction, interior design or other related fields. CAD (Drafting) projects include: learning the AutoCAD software, multi-view drawing, dimension drawings, section drawings, and isometric drawings.

3D CAD

Credit: 1/2 (cr/nc)	Level: IV
Grade offered: 11, 12	Fall AT8531
	Spring AT8532
Prerequisite: CAD (Drafting)	

This course studies three-dimensional (3D) CAD techniques and applications with emphasis on increasing productivity in the creation and editing of 3D models using AutoDesk Inventor software. Focuses on the nature of solid modeling as contrasted with traditional two-dimensional techniques emphasizing mechanical applications. Includes development and editing of solid entities, wireframe modeling, surfacing, shading, 3D primitives of solids, plotting 3D models on the 3D printer, and generating solids that aid in 3D construction models in manufacturing situations.

Architectural Drafting (CAD)

Credit: 1 (cr/nc)	Level: IV
Grade Offered: 10	Annual AT9216
	AT9217
11, 12	Annual AT9211
	AT9212
Prerequisite: CAD (Drafting)	

Students in this course will be creating architectural models in a virtual 3D environment. Full colored renderings, applying building materials as well as computer generated walkthroughs of buildings are all covered in this course. The AutoCAD Architecture and Autodesk Revit software is the primary tool used for virtual modeling. Students will plot out 3D drawings using an industry standard plotter. The course covers common

residential construction materials, components, and systems as related to wood frame structures. Students will produce a professional set of presentation and construction drawings of a residential structure. After the design drawing is complete the student will create a scaled building as a prototype to present to the customer.

AUTOMOTIVE

Small Engines

Credit: 1/2 (cr/nc)	Level: III
Grade Offered: 9, 10	Fall AT6226
	Spring AT6227
Prerequisite: None	

Small Engines is the first class that is taken on the road to become a qualified and respected automotive technician. The course introduces the small engine and uses it to demonstrate in depth concepts such as 2 and 4 stroke theory, combustion, thermodynamics, torque, and touches on alternative fuel sources such as air, solar, bio-fuel, E85, electric, and hybrids. Students will learn diagnostic procedures to resolve common issues and become proficient in the disassembly and reassembly of the 2 and 4 stroke horizontal and vertical small engine.

Advanced Small Engine Performance

Credit: 1/2	Level: IV
Grade Offered: 10	Fall AT6336
	Spring AT6337
11, 12	Fall AT6331
	Spring AT6332
Prerequisite: Small Engines/Power	

Ever wonder what it would be like to take a small engine and double its horsepower? This class emphasizes the performance aspect of the small engine. Students will perform a detailed analysis of a small engine using a dynamometer to measure its overall performance; including horsepower, torque, intake/exhaust temperatures, timing, air/fuel ratios, and more. Students will then disassemble the small engine and create their own customized racing engine using performance parts like big bore cylinder kits, lightened flywheels, Mikuni carburetors, MSD ignitions, forged piston/rods, cams, and even nitrous (NOS). Then it's back to the dynamometer where students will retest their new performance engine. Students will then return the engine to its original form and test for proper operation.

Car Care Essentials

Credit: 1/2 (cr/nc) Level: IV
Grade Offered: 11, 12 Fall AT5911
Spring AT5912
Prerequisite: None

Don't leave home without it! This course will teach the necessary skills in basic car care, preventative maintenance, and road-side safety. Students will learn how to maximize the life of his/her vehicle while saving money and becoming a self-sufficient automotive technician. Students will have the opportunity to work on live vehicle repairs after covering units such as, vehicle history, vehicle ID methods, under hood checks, lubrication and cooling systems, tires, brakes, steering and suspension, purchasing used vehicles, and detailing an automobile. This course is the foundation of the automotive program.

Automotive Service & Diagnostics

Credit: 1 (cr/nc) Level: IV
Grade Offered: 11, 12 Annual AT5311
AT5312
Prerequisite: Recommended Car Care Essentials

Automotive Technology is the capstone course of the Automotive Program. Special emphasis will be on diagnostic procedures. Students will become proficient using equipment such as scan tools, digital oscilloscopes, emissions gas analyzers, and digital multi-meters. Students will have the opportunity to complete live lab work on a variety of vehicles/manufactures, communicate as a service consultant with the vehicles respective owners, set up appointments, and manage lab teams. Students will disassemble and reassemble a variety of automotive engines and will test them for proper operation. Finally, students will learn skills such as welding, fabrication, and different design techniques to create custom projects such as mini choppers, go-karts, cooler karts and more. The sky is the limit.

ENGINEERING

Engineering and Invention 1

Credit: 1/2 (cr/nc) Level: III or IV
Grade Offered: 9, 10 Fall AT5546
11,12 Spring AT5547
Fall AT5541
Spring AT5542
Prerequisite: None

This is a course for the student who wants to explore engineering as a career. This course uses STEM (Science, Technology, Engineering, Mathematics) project based assignments. Problem solving is utilized to overcome problems of design, development, production, and the testing of a product. Topics covered could include but not limited to; mechanical, structural, electricity, hydraulics, magnetism, and CNC programming. Students will use a variety of softwares to design, test, and analyze problems. Students will work in design teams and present their finds to the class in various applications.

Engineering and Invention 2

Credit: 1/2 (cr/nc) (dc) Level: IV
Grade Offered: 11, 12 Fall AT6411
Spring AT6412

Prerequisite: Algebra I (Accel) or higher, or concurrent enrollment in Algebra I (Accel) or higher
Engineering and Invention 1, Principles of Aeronautical Science or Division Chair approval

This is a continuing course of Engineering 1. Still using STEM (Science, Technology, Engineering, Mathematics) project based assignments. Problem solving is utilized to overcome problems of design, development, production, and the testing of a product. Topics covered could include but not limited to; mechanical, structural, pneumatics, vacuum forming, robotics, and materials. Students will use a variety of softwares to design, test, and analyze problems. Students will work in design teams and present their finds to the class in various applications.

FURNITURE MAKING

Introduction to Furniture Making

Credit: 1/2 (cr/nc)	Level: III
Grade Offered: 9, 10	Fall AT5716
	Spring AT5717
11, 12	Fall AT5711
	Spring AT5712
Prerequisite: None	

This course has been designed to introduce the student to the safe operation of industrial machinery, power tools, and hand tools by making a custom piece of furniture. This course gives the student a basic understanding of how to use each of these items in order to make furniture. It will begin with an in-depth study of the machinery and power tools used in this industry with a major influence of how they work, and most importantly, how to use them in a safe and productive manner to produce furniture. Each student will then have an opportunity to custom-make a beginning level piece of furniture that he/she will bring home at the end of the semester. **Students will be responsible for lumber and hardware fees of \$45.00.**

Furniture/Cabinet Making I

Credit: 1 (cr/nc)	Level: IV
Grade Offered: 9, 10	Annual AT5846
	AT5847
11, 12	Annual AT5821
	AT5822
Prerequisite: None	

This course will allow the student to study furniture making by using hand tools, power tools, and industrial machinery. During this year-long course, students will be given the opportunity to make a four-piece, solid hardwood living room set that will include two end tables with drawer boxes, one coffee table, and an optional sofa table with a drawer box. Choices of woods are red oak, quartered red oak, white oak, quartered white oak, ash, cherry, walnut, maple, and mahogany. Students will be responsible for lumber and hardware fees.

Furniture/Cabinet Making II

Credit: 1 (cr/nc) (dc)	Level: IV
Grade Offered: 10	Annual AT5856
	AT5867
11, 12	Annual AT5851
	AT5852
Prerequisite: Furniture and Cabinet Making I	

This course is the next course in this series and has been designed to allow the student to continue to study advanced furniture and cabinetry skills. Students will build on the previous year's knowledge base by being given the opportunity to make a solid wood computer table/writing

desk with a pullout keyboard or dovetailed drawer boxes. If you are taking the course for duplicate credit you will make a small entertainment center by using veneered plywood, solid wood face frames, dovetailed drawer boxes, raised paneled drawer fronts, crown moldings, and solid raised paneled doors. Choices of woods are red oak, quartered red oak, white oak, quartered white oak, ash, cherry, walnut, maple, and mahogany. Students will be responsible for lumber and hardware fees.

GENERAL ELECTIVES

Technology Concepts

Credit: 1/2 (cr/nc)	Level: III or IV
Grade Offered: 9, 10	Fall AT4726
	Spring AT4727
Prerequisite: None	

Learn what Applied Technology is all about! Through hands-on activities and computer programs, students will learn about the occupational areas of communications, energy production, and transportation. Projects will be created using applied physics, CAD (computer aided drafting), electronics, and manufacturing. This semester course will introduce you to other Applied Technology courses that are available.

Home Maintenance and Repair

Credit: 1/2 (cr/nc)	Level: III
Grade Offered: 11, 12	Fall AT5221
	Spring AT5222
Prerequisite: None	

This course is for students who wish to learn the basic skills in maintaining a home. Students learn how to repair or upgrade the electrical service, basic framing construction, drywall installation and repair, trim techniques, painting, installation of ceramic tile and glazing materials, window repair, and basic plumbing.

Career Internship Program

Credit: 1/2 (dc)	Level: IV
Grade Offered: 11, 12	Fall AT5571
	Spring AT5572
	Summer AT5558 or AT5559

This course is designed for the student who is seeking work experience in an area that they wish to pursue as a career upon graduation or after attending college. The student will apply for the internship through the department that they wish to receive credit for the experience. The student will work a minimum of 90 hours during the semester for credit for the course. The student will have weekly contact with the supervising teacher, develop a culminating project based upon the experience, be evaluated by the supervising teacher and the employer for the final grade. The student is responsible for their



own transportation to and from the work place. This course may be taken for duplicate credit. It is the sole discretion of each department team to recommend the student for a work internship. Application does not guarantee admission.

Industrial and Related Occupations I

Credit: 2 (cr/nc classroom only)	Level: III
Grade Offered: 11, 12	Annual AT4311
	AT4312
	Annual AT4411
	AT4412
<i>Work Experience students must enroll in both classroom and work experience.</i>	
Prerequisite: 16 years old and approval of parents, counselor, and course coordinator	

This course, commonly called I.R.O., is designed for students who wish to obtain experience in the world of work prior to graduation from high school with the purpose of enabling the student to make a better career choice after high school. The experience must be industrial-occupation oriented. It gives students an opportunity to use skills obtained from courses that they have been taking in high school. The main objective is to develop in each student

the abilities, attitudes, and skills necessary to assure a more successful transfer from school oriented activities to adult living. Students and parents are also required to sign a “Student Agreement and Training Memorandum” in which the guidelines are reviewed. See p. 71 for guidelines.

Industrial and Related Occupations II

Credit: 2 (cr/nc classroom only)	Level: III
Grade Offered: 12	Annual AT4321
	AT4322
	Annual AT4421
	AT4422
<i>Work Experience students must enroll in both classroom and work experience.</i>	
Prerequisite: Industrial and Related Occupations I	

This course is an extension if I.R.O.I. Students are expected to continue obtaining experience in the world of work within the community. Different occupations may be tried, if desired. The classroom instruction is individualized to meet each student’s personal needs. Experience on the job must be industrial-occupation oriented. Students and parents are also required to sign a “Student Agreement and Training Memorandum” in which the guidelines are reviewed. See p.71 for guidelines.

Have you ever considered a career in?

Drafting Careers

Architect	Drafts person
Building trades	Engineer
C.A.D. Operator	Sales of manufactured products

Building Trades Careers

Carpenter	Painter
Electrician	Plasterer/drywaller
Heating & air conditioning installer	Plumber

Metalworking Careers

Computerized machine operator	Metal fabrication
Machinist	Sales of any manufactured product
Mechanical & industrial engineer	Tool and die maker

Transportation Careers

Aerospace electronics	Parts specialist
Auto mechanic	Parts and service manager
Aviation electronics	Sales
Aviation mechanic	Service manager
Brake specialist	Service station attendant
Commercial pilot	Service writer
Diagnostic technician	Shop supervisor
Electrical specialist	Small engine mechanic
Engineers/technicians	Transmission specialist
Front end specialist	Tune-up specialist

Woodworking Careers

Building Construction	Model maker
Cabinetmaker	Sales
Carpenter	Sample body-maker
Form builder	Wood pattern-maker
Millwright	

Courses

Architectural Drafting (CAD)
CAD (Drafting)
Engineering & Invention 1 & 2
Technology Concepts

Courses

Furniture/Cabinet Making I & II
Introduction to Furniture Making
Home Maintenance and Repair

Courses

Technology Concepts

Courses

Private Pilot Operations
Auto Maintenance
Automotive Technology
Aviation
Principles of Aero Science
Small Engines/Power
Technology Concepts
Careers in Aviation
Intro to Space Flight

Courses

Furniture/Cabinet Making I & II
Introduction to Furniture Making
Home Maintenance and Repair
Technology Concepts

Applied Technology Classes

When choosing Annual Courses, you will need the first and second semester codes.

Freshman Courses

Annual

AT5846/7 Furniture / Cabinetmaking I

Fall Only

AT5156 Aviation
 AT5536 CAD (Drafting)
 AT5546 Eng & Invention 1 CAD
 AT5716 Intro Furniture Making
 AT6226 Small Engines /Power
 AT4726 Technology Concepts Eng

Spring Only

AT3127 Careers in Aviation
 AT5537 CAD (Drafting)
 AT5547 Eng & Invention 1 CAD
 AT5717 Intro Furniture Making
 AT6227 Small Engines /Power
 AT4727 Technology Concepts

Sophomore Courses

Annual

AT9216/7 Architectural Drafting (CAD)
 AT5846/7 Furniture / Cabinetmaking I
 AT5856/7 Furniture / Cabinetmaking II

Fall Only

AT5156 Aviation
 AT5216 Principles of Aeronautical Science (AS120)
 AT5536 CAD Drafting
 AT5546 Eng & Invention 1
 AT5716 Intro Furniture Making
 AT6226 Small Engines /Power
 AT4726 Technology Concepts

Spring Only

AT5217 Principles of Aeronautical Science (AS120)
 AT3127 Careers in Aviation
 AT5537 CAD Drafting
 AT5547 Eng & Invention 1
 AT5717 Intro Furniture Making
 AT6227 Small Engines /Power
 AT4727 Technology Concepts

Junior and Senior Courses

Annual

AT3361/2 Private Pilot Operations
 AT9211/2 Architectural Drafting (CAD)
 AT5311/2 Automotive Service & Diagnostics
 AT5821/2 Furniture / Cabinetmaking I
 AT5851/2 Furniture / Cabinetmaking II
 AT4311/2 Industrial & Related Occupations I
 AT4321/2 Industrial & Related Occupations II
 AT4411/2 Work Exp IRO 1
 AT4421/2 Work Exp IRO 2

Fall Only

AT5211 Principles of Aeronautical Science (AS120)
 AT3221 Intro Space & Flight SP110
 AT5911 Car Care Essentials
 AT5531 CAD Drafting
 AT5541 Eng & Invention 1
 AT8531 3-D CAD
 AT6411 Engineering & Invention 2 (EGR101)
 AT5711 Intro Furniture Making
 AT5221 Home Maintenance and Repair
 AT6331 Adv. Small Engine Performance

Spring Only

AT5212 Principles of Aeronautical Science (AS120)
 AT3222 Intro Space & Flight SP110
 AT5912 Car Care Essentials
 AT5532 CAD Drafting
 AT5542 Eng & Invention 1
 AT8532 3-D CAD
 AT6412 Engineering & Invention 2
 AT5712 Intro Furniture Making
 AT5222 Home Maintenance and Repair
 AT6332 Adv. Small Engine Performance

Fall or Spring

AT5571/2 Career Internship